LEYKIN, A.S., kand. tekhn. nauk; VINOGRADOV, B.N., inzh.

Study of hydration and hardening processes of emulsified polymer mineral mortars. Sbor. trud. VNIINSM no.8:57-64 '63. (MIRA 17:9)

YAVORSKIY, A.K., inzh.; VINOGRADOV, B.N., inzh.

Effect of an accelerated cycle of autoclaving on the process of the hardening of lime keramzit concrete. Trudy GISI no.47:7-22 '64. (MIRA 18:11)

FADEYEVA, V.S., dr. tekhn. nauk; VINOGRADOV, B.N., inzh.

Phase conversions and structure formation during the kilning of keramzit. Sbor. trud. VNI NSM no.8:75-83 '63. (MIRA 17:9)

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New binding material on a hydrotalcite base. Sbor. trud. VNIINSM no.8:105-112 '63. (MIRA 17:9)

SHVARTSZAYD, M.S., kand. tekhn. nauk; SIDOROV, Ye.P., inzh.; VINOGRADOV, B.N., inzh.

Reactive capacity of carbonate additions during autoclave treatment of lime-sand mixtures. Sbor. trud. VNIINSM no.8:122-133 '63. (MIRA 17:9)

VOLZHENSKIY, A.V., laureat Leninskoy premii, prof., doktor tekhn.nauk; VOROB'YEV, I.A.; GLADKIKH, K.V., inzh.; VINOGRADOV, B.N., inzh.; IL'YENKO, I.A., inzh.

Use of binding materials made of granulated fuel slag for the manufacture of wall materials. Stroi. mat. 8 no.5:5-8 My '62. (MIRA 15:7)

1. Direktor zavoda stenovykh blokov No.21 Glavnogo upravleniya promyshlennosti stroitel'nykh materialov pri ispolnitel'nom komitete Moskovskogo gorodskogo Soveta deputatov trudyashchikhsya (for Vorob'yev).

(Slag)
(Building materials)

ZORIN, V.N.; KONYUKHOV, I.N.; VINOGRADOV, B.N.; CHERNOBYL'SKIY, A.G.; ALEKSANDROV, V.S.

Reduction turbodrill for drilling slim and deep wells. Trudy MINKHiGP 46:27-34 '64. (MIRA 17:6)

VINOGRADOV, B.N.

Largest compressor plant. Stroi.truboprov. 9 no.2:6-8 F '64.
(MIRA 17:3)

VRUBLEVSKIY, L.Ye.; VINOGRADOV, B.N.

Structure formation in clay shale during its conversion to keramzit. Stroi. mat. 10 no.9:33-35 S '64 (MIRA 18:2)

DZHIGIRIS, D.D.; SIDOROV, Ye.P.; VINOGRADOV, B.N.

Effect of the fineness of component materials on the properties of gas concretes. Izv.AN Turk.SSR.Ser.fiz.-tekh., khim.i geol.nauk no.3:63-67 '63. (MIRA 17:3)

1. Institut seysmostoykogo stroitel'stva AN Turkmenskoy SSR.

9.2580, 9.4310

77963
SOV/109-5-3-17/26

AUTHORS: Kuz'min, V. A., Vinogradov, B. N.

TITLE: Influence of Saturation in Transistor Triodes on Multivibrator Operation

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 490-496 (USSR)

ABSTRACT: A method is proposed of calculating the time for the removal of surplus charge carriers from the base of a transistor triode. It is applicable to pulse circuits. The influence of saturation on the build-up time and width of multivibrator pulses is investigated theoretically and experimentally for two-junction triodes. Introduction. 1. Calculation of carrier removal time by the charge method. The equation of conservation of the total hole charge in the transistor triode base is

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$$\frac{dQ}{dt} = I_{pe} - I_{pk} - I_R. \qquad (1)$$

where $Q = q\int_V (p - p_n)\,dV$ is hole charge in base of arbitrary volume V, exceeding the equilibrium charge; I_{pe} and I_{pk} are hole currents for emitter and collector; I_R is recombination current. In a previous work by V. A. Kuz'min (Izv. MVO (Radiotekhnika) 1959, 2, 5) it was shown that in the first approximation of determining the removal time, the electron currents in the junctions can be ignored, and it can be assumed that $I_{pe} = I_e$, $I_{pk} = I_k$. Assuming $I_R = Q/\tau_p$, where τ_p is the constant lifetime of holes in the base, Eq. (1) can be transformed to

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$$\frac{dQ}{dt} = -\frac{Q}{\tau_p} + I_b. \qquad (2)$$

Solution of (2) for any $I_b(t)$ with initial condition $Q(0) = Q_o$ is

$$Q(t) = \left[Q_0 + \int_0^t I_б(t)\, e^{t/\tau_p} dt\right] e^{-t/\tau_p}. \qquad (3)$$

If for t - T_p the triode changes from saturation to the amplification region, the hole charge in the base $Q(T_p)$ can be determined with a good approximation by

$$Q(\tau_p) = \frac{I_к(T_p)\,\tau_p}{\beta}, \qquad (4)$$

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where I_k (T_p) is collector current for $t = T_p$; β is amplification coefficient for circuit with common emitter. Now, the equation for determining the removal time T_p is

$$\left[Q_0 + \int_0^{T_p} I_\kappa(t) e^{t/\tau_p} dt\right] e^{-T_p/\tau_p} = \frac{I_\kappa(T_p)}{\beta} \tau_p. \qquad (5)$$

2. Influence of saturation on processes in the multivibrator.

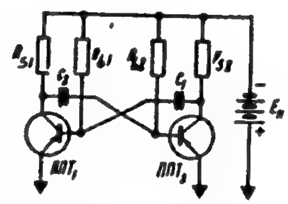

Fig. 1. Multivibrator circuit.

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In the illustrated circuit the multivibrator triode ППТ/1 is assumed conducting but $ППТ_2$ is non-conducting. The capacitor is being recharged, voltage at $ППТ_1$ base drops close to zero and the triode conducts. A part of $ППТ_1$ collector current flows to the base of $ППТ_2$ and hole removal of this base starts. While the $ППТ_2$ collector potential remains close to zero, the feedback to $ППТ_1$ is inactive and $ППТ_1$ continues to operate as an amplifier. The feedback commences only after the end of the removal of surplus carriers from $ППТ_2$ base, and a fast regeneration process starts. Thus, saturation causes a considerable increase of the front pulse of collector voltage of the conducting triode. The partial charge loss by C_2 during recombination shortens the flat pulse part of the closed $ППТ_2$, but at higher

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saturation the multivibrator oscillations may be disrupted. The removal time is calculated under the following simplifying assumptions: (1) The triode characteristics are linearly segmented. Triode begins conducting at $V_b = 0$, and its parameters R_{in}, R_{out}, β_1 and $C_{out} \simeq \beta_1 C_k$ assume their constant magnitudes abruptly. (2) The input resistance of the saturated triode may be ignored since it is considerably lower than the external resistances of the circuit. (3) The collector current during removal is constant and equals $I_{ks} = E_k/R_s$.

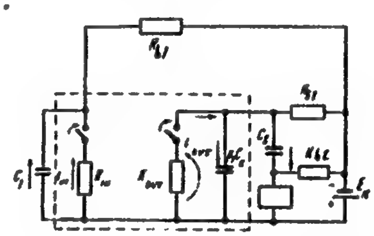

Fig. 2. Equivalent circuit of a multivibrator.

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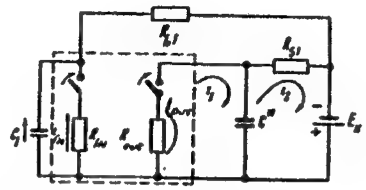

Fig. 3. Simplified equivalent circuit of a multivibrator during the removal period.

The dotted outline on Fig. 2 indicates the triode IIIIT$_1$. The triode layout per above figures has separated input and output circuits, thus, simplifying all calculations. The capacitances C_2 and $\beta_1 C_k$ can be considered parallel connected and designating $C_2 + \beta_1 C_k = C''$; the equivalent

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circuit per Fig. 3 is made, which is described by Eq. A:

$$\frac{dU_{C_1}}{dt}+U_{C_1}\frac{R_{IN}+R_{\ell 1}}{R_{\ell 1}R_{IN}C_1}=\frac{E_{H}}{R_{\ell 1}C_1};$$

$$U_{C'}+i_1 R_{ovr}-i_{out}R_{ovr}=0;$$

$$U_{C'}+E_{H}-i_2 R_{\delta 1}=0;$$

$$i_1-i_2=i_{C'};\ i_{C_2}=\frac{C_2}{C_2+\beta_1 C_H}i_{C'}.$$

The input and output currents are related per

$$i_{IN}=i_{IN}(0)h(t)+\int_0^t i'_{IN}(t-\tau)h(\tau)d\tau,$$

where $h(t)=\beta_1(1-e^{-t/\tau_{p1}})$. Using these equations and relation

$$I_{\delta 2}=\frac{E_{H}}{R_{b2}}-i_{C_2}$$

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$I_{b2}(t)$ can be determined. The hole charge Q_o in ППТ$_2$ base at moment $t = 0$ is a solution of (2) for $I_{b2} = E_k/R_{b2}$. If the multivibrator pulse-width, while ППТ$_2$. If the multivibrator pulse-width, while ППТ$_2$ conducts, equals t_1, then

$$Q_0 = \tau_{p2} \frac{E_\kappa}{R_{\text{б}2}} (1 - e^{-t_1/\tau_{p2}}).$$

Usually $t_1 \geqslant 2$ and $Q_o \simeq {}_{p2}E_k/R_{b2}$. Substituting now the values of $I_{b2}(t)$ and Q_o into (5), a transcendental equation for calculating T_p is derived, the solution

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of which is very complicated. A simplification is achieved by substituting into it the mean hole life time τ_p (instead of τ_{p1} and τ_{p2}) of both tirodes, and expanding it under certain assumptions into a series, of which only the quadratic terms need be taken. Thus the following relations are derived

$$T_p = \tau_p \frac{b + c + \sqrt{(b + c)^2 + 2(a - b)(b - d)}}{a - b}. \qquad (8)$$

WHERE

$$a = \frac{\beta_1}{R_{in} + R_{b1}} \frac{R''C_2}{R''C^* - R'C_1}; \qquad b = \frac{1}{R_{b2}} - \frac{1}{\beta_2 R_{b2}},$$

$$c = a \frac{R'C_1}{\tau_p - R'C_1}; \qquad d = c \frac{R'C_1}{\tau_p - R'C_1}.$$

For calculating the time T_p, Eq. (6) may be used, but complications arise because the mean base current $I_{b2}(t)$ for the removal time is not known. As an approximation for engineering calculations

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$$\overline{I_{b2}(t)} = \frac{1}{\tau_p} \int_0^{\tau_p} I_{b2}(t)\,dt. \qquad (9)$$

can be used. The capacitor voltage at time T_p i determined from the equivalent circuit (Fig. 3).

$$U_{C_1}(T_p) = \frac{E_k \beta_1 R''}{R_{in} + R_{b1}} \left[1 - \frac{\tau_{p1}^2}{(\tau_{p1} - R'C_1)(\tau_{p1} - R''C'')} e^{-T_p/\tau_{p1}} + \right.$$
$$\left. + \frac{(R'C_1)^2}{(\tau_{p1} - R'C_1)(R'C_1 - R''C'')} e^{-T_p/R'C_1} - \frac{(R''C'')^2}{(\tau_{p1} - R''C'')(R'C_1 - R''C'')} e^{-T_p/R''C''} \right] +$$
$$+ E_k\left(\frac{R''}{R_{s1}} - 1\right) e^{-T_p/R''C''} - E_k \frac{R''}{R_{s1}}, \qquad (10)$$

where T_p is determined from (8) or (9). Duration of the flat pulse part can be determined from equation derived by K. S. Rzhevkin, et al. (this Journal

2, 9, 1110 (1957)),

$$T_i = \frac{R_{b2}(r_{k02} + R_{s2})}{R_{b2} + r_{k02} + R_{s2}} C_2 \ln \frac{E_k + V'_{b2}}{E_k}, \qquad (11)$$

where r_{k02} is voltage on the collector junction of and V_{2b} is voltage of capacitance C_2 of the triode ППT_2 after end of regeneration process, respectively. The charge lost by the capacitance during regeneration is considerably lower than during recombination, and therefore with good approximation, it may be written

$$V'_{b2} = U_{C_2}(T_p).$$

3. Experiment. The purpose of experiments was determination of T_p and the pulse width with respect to the circuit elements. Experimental and theoretical data were plotted on diagrams. Figure 5 shows an experimental curve (1) and two theoretical curves (2) and (3).

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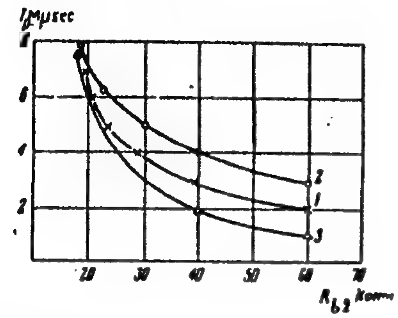

Fig. 5.

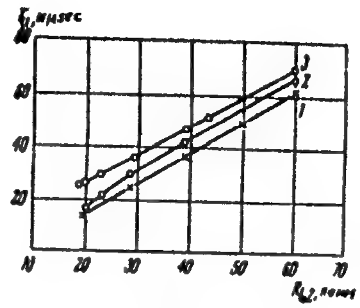

Fig. 6.

Fig. 5. Removal time vs magnitude of R_{b2}.

Fig. 6. Pulse duration vs magnitude of R_{b2}.

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Curve (2) of Fig. 5 was calculated from Eq. (8), but curve (3) from (9) and (6). The multivibrator parameters were $\tau_{p1} = 9\ \mu$sec, $\tau_{pz} = 6\ \mu$sec, $\beta_1 = 34$, $\beta_2 = 30$, $R_{1r} = 500$ ohm; $R_{out} = 50,000$ ohm; $R_{s1} = 5,000$ ohm, $R_{s2} = 5,000$ ohm, $C_1 = 10^3$ pf, $C_2 = 2x10^3$ pf, $E_k = 10$ v, $r_{k02} = 1$ meg. ohm, $C_k = 25$ pf, $R_{b1} = 100{,}000$ ohm. In Fig. 6 curve (1) is experimental, and curve (2) calculated from (10) and (11). Curve (3) was determined without consideration of charge loss by capacitance C_2. Parameters are the same as before, but $C_2 = 1,800$ pf. Parameters were determined by usual methods at base currents and collector voltages corresponding to the circuits, and then averaged. Comparison of theoretical results with experiments showing approximately 30% difference, proves the correctness of the method of calculations, the difference being caused by simplifying assumptions of the equivalent circuit and the averaging of triode parameters. There

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are 6 figures; 1 table; and 6 Soviet references.

ASSOCIATION: Department of Physics, Moscow Goverhment University imeni M. V. Lomonosov (Fizicheskiy Fakul'tet Moskovskogo Gosudarstvennogo Universiteta imeni M. V. Lomonosova)

SUBMITTED: June 14, 1959

VOLSHENSKIY, A.V., prof. doktor tekhn. nauk; TIRANOVA, T.M., inzh.; VINOGRADOV, B.N., inzh.

Sulfate resistant cements from slag of electrophosphorous production. Stroi.mat. 10 no.8:26-28 Ag '64. (MIRA 17:12)

VINOGRADOV, B.N.

Conference of efficiency experts, inventors and young specialists.
Stroi. truboprov. 10 no.1:39 Ja '65. (MIRA 18:4)

VINOGRADOV, B.N.

Creative seminar of young specialists. Stroi. trub. 9 no.7:
8 Jl '64. (MIRA 17:11)

SHVARTSZAYD, M.S.; SIDOROV, Ye.P.; VINOGRADOV, B.N.

Interaction of calcium hydroxide and carbonate under autoclave treatment. Izv.AN Turk.SSR.Ser.fiz.-tekh., khim.i geol.nauk no.1: 51-56 '62. (MIRA 16:12)

1. Institut antiseysmicheskogo stroitel'stva AN Turkmenskoy SSR.

VINOGRADOV, B.N., kand.tekhn.nauk

Determination of standard loads and coefficients of overloads according to results of rock pressure measurements. Transp.stroi. 13 no.9:59-61 S '63. (MIRA 16:12)

VINOGRADOV, B.N., inzh.; GREBENIK, Ye.A., inzh.; GLADKIKH, K.V., inzh.

Hardening processes of binding materials made of granulated blast-furnace slags subject to heat and moisture treatment. Stroi. mat. 9 no.4:12-15 Ap '63. (MIRA 16:5)
(Binding materials) (Slag)

POPOV, N.A., zasl. deyatel' nauki i tekhniki, prof.; KRASNOVA, G.V., kand. tekhn. nauk; VINOGRADOV, B.N., inzh.; ROGACHEVA, O.I., inzh.; GLEZAROVA, [redacted]V, N.K., tekhn. red.

[Lightwight autoclave concretes with porous filters] Legkie avtoklavnye betony na poristykh zapolniteliakh. Moskva, Gosstroiizdat, 1963. 92 p. (MIRA 16:7)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Popov).

(Concrete)

VINOGRADOV, B.N., inzh.

Phase composition and structure of agloporite. Sbor.trud. VNIINSM no.6:167-180 '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov Akademii stroitel'stva i arkhitektury SSSR.
(Aggregates (Building materials))

VOLZHENSKIY, Aleksandr Vasil'yevich, Laureat Leninskoy premii, doktor tekhn. nauk, prof.; BUROV, Yuriy Sergeyevich, kand. tekhn. nauk; VINOGRADOV, Boris Nikolayevich; GLADKIKH, Klara Vasil'yevna, kand. tekhn. nauk; NIKOLAYEVA, N.M., red.izd-va; SHERSTNEVA, N.V., tekhn. red.

[Concretes and products based on slag and ash cements; hardened in steam chambers and autoclaves] Betony i izdeliia na shlakovykh i zol'nykh tsementakh; pri tverdenii v propa-rochnykh kamerakh i avtoklavakh. Pod obshchei red. A.V. Volzhenskogo. Moskva, Gosstroiizdat, 1963. 361 p. (MIRA 16:12)

(Precast concrete)

VOLZHENSKIY, A.V., prof., zasluzhennyy deyatel' nauki i tekhniki RSFSR; IL'YENKO, I.A., inzh.; VINOGRADOV, B.N., inzh.

Deformation and strength properties of concretes made with binding materials based on fuel granulated slags. Bet. i zhel.-bet. 8 no.12:549-553 D '62. (MIRA 16:2)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Volzhenskiy).

(Concrete—Testing)
(Slag)

BUT, T.S.; VINOGRADOV, B.N.; GAVRILOVA, T.I.; GORSHKOV, V.S.; DOLGOPOLOV, N.N.; MYAGKOVA, M.A.; SIROTKINA, N.L.; FADEYEVA, V.S., doktor tekhn. nauk, red.; GURVICH, E.A., red. izd-va; GOL'BERG, T.M., tekhn. red.

[Modern methods of studying building materials]Sovremennye metody issledovaniia stroitel'nykh materialov [By] T.S.But i dr. Pod obshchei red. V.S.Fadeevoi. Moskva, Gosstroiizdat, 1962. 238 p. (MIRA 16:1)

(Building materials)

VINOGRADOV, B.N., inzh.

Intensification of the process of calcining lime with the aid of mineralizers. Stroi. mat. 8 no.2:30-32 F '62. (MIRA 15:3)
(Lime)

VINOGRADOV, B.N., kandidat tekhnicheskikh nauk.

On the problem of cementation in concrete structures. Trudy TSNIS MPS no.9:102-115 '53. (MIRA 8:1)
(Concrete--Testing)

VOLZHENSKIY, A.V., prof.; VINOGRADOV, B.N., inzh.

Composition of overburned lime and causes of overburning. Stroi. mat. 7 no.6:30-32 Je '61. (MIRA 14:7)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Volzhenskiy).

(Lime)

VOLZHENSKIY, A.V., prof.; GLADKIKH, K.V., inzh.; VINOGRADOV, B.N., inzh.

Investigating the hardening processes in binding materials made with granular furnace slags. Stroi. mat. 6 no.6:31-33 Je '60. (MIRA 13:6)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Volzhenskiy).
(Binding materials) (Slag)

VINOGRADOV, B.N.; FADEYEVA, V.S.; ELINZON, M.P.

Effect of the roasting and cooling cycle on the phase composition, structure, and strength of agloporite. Sbor. trud. VNIINSM no.4:45-55 '61. (MIRA 15:2)
(Aggregates (Building materials)—Testing)

VINOGRADOV, B.N.

Study of the effect of a type of lime and a method of grinding quartz sand on their interaction during steaming. Sbor. trud. VNIINSM no.4:56-76 '61. (MIRA 15:2)
(Sand-lime products—Testing)

VINOGRADOV, B.N.; SHLEPOVA, N.K.

Preparation of transparent and polished thin sections of new building materials. Sbor. trud. VNIINSM no.4:114-120 '61. (MIRA 15:2)

(Building materials--Testing)

SIDOROV, Ye.P.; VINOGRADOV, B.N.

Effect of vibration modification on the phasic composition, structure, and strength of microsilicate. Izv. AN Turk. SSR. Ser. fiz.-tekh., khim. i geol.nauk no.5:61-66 '61. (MIRA 14:11)

1. Institut antiseysmicheskogo stroitel'stva AN Turkmenskoy SSR. (Silicates) (Vibration)

VINOGRADOV, B.N., inzh.

The effect of carbonate inclusions in the raw material on the quality of agloporite. Sbor.trud.VNIINSM no.6:18-24 '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov Akademii stroitel'stva i arkhitektury SSSR.

(Rocks, Carbonate)
(Aggregates(Building materials))

VINOGRADOV, B.N.; SIDOROV, Ye.P.

Effect of macrocrystalline calcium oxide on the strength and structure of gas silicates. Izv. AN Turk. SSR. Ser. fiz.-tekh., khim. i geol. nauk no.6:88-94 '61. (MIRA 15:3)

1. Institut antiseysmicheskogo stroitel'stva AN Turkmenskoy SSR.

(Silicates)

VOLZHENSKIY, A.V., doktor tekhn.nauk, prof.; GLADKIKH, K.V., inzh.; VINOGRADOV, B.N.

Hardening of binding materials based on granulated fuel slags. Sbor. trud. VNIIINSM no.2:52-74 '60. (MIRA 15:1)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Volzhenskiy).

(Slag)
(Binding materials)

VINOGRADOV, B.N., inzh.

Phase conversions in mixes of lime and roasted clay (keramzit) during autoclave treatment. Sbor. trud. VNIINSM no.4:134-170 '61. (MIRA 15:2)

(Clay--Testing)
(Concrete--Testing)

VINOGRADOV, B.N.

On the route of the Bukhara - Ural gas pipelines. Stroi. truboprov. 7 no.1:17-18 Ja '62. (MIRA 16:7)

(Gas, Natural--Pipelines)

KOVALENKO, A.F.; VINOGRADOV, S.N.

Mineralogical characteristics of clay soils in Turkmenistan. Izv. AN Turk.SSR. Ser. fiz.-tekh., khim. i geol. nauk no.2: 70-78 '63. (MIRA 17:8)

1. Institut seysmostoykogo stroitel'stva AN Turkmenskoy SSR.

VINOGRADOV, B.N.

Precast concrete construction on oil fields. Stroi. truboprov. 9 no.6:16-17 Je '64. (MIRA 17:12)

SOV/121-58-10-4/25

AUTHOR: ~~Vinogradov, B.P.,~~
Inozemtsev, V.I.

TITLE: Hydraulic Presses for the Manufacture of Electrically Welded High Pressure Tubes (Gidravlichyeskiye pressy dlya izgotovleniya elektrosvarnykh trub vysokogo davleniya).

PERIODICAL: Stanki i Instrument, 1958, Nr 10, pp 15-17 (USSR)

ABSTRACT: The welded steel tube production line of the Chelyabinsk Tube Rolling Mill (Chelyabinskiy truboprokatnyy zavod) is based on a newly developed technique of bending the tube from strip in 12 m lengths. The cut strip is first bent into a shallow channel with rounded flanges. Then the channel is folded to produce an oval section with flat sides which is subsequently formed into a round slotted tube. The edges are brough together for welding, after which the tube is calibrated by expansion, straightened, heat-treated and tested. The bending operations are carried out on standardized hydraulic presses after planing and bevelling the edges of the strip. The

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SOV/121-58-10-4/25

Hydraulic Presses for the Manufacture of Electrically Welded High Pressure Tubes

design and working of the presses are described in detail, with special emphasis on a new calibrating, straightening testing machine. The tubes are expanded to size by cold work through internal pressure. The machine is largely automatic and handles seventeen tubes per hour of 720 mm diameter. All the presses were designed by the Central Design Office for Press Forming Machinery (Tsentral'noye proyektno-konstruktorskoye byuro kuznechno-pressovogo mashinostroyeniya) and manufactured by the Kolomna Heavy Machine Tool Works (Kolomenskiy zavod tyazhelogo stankostroyeniya). There are 4 illustrations including 3 photos.

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VINOGRADOV, B.S.

Efficient lighting for X-ray darkrooms. Voen.-med.zhur. no.9:73-75
S '51. (MLRA 9:9)
(ELECTRIC LIGHTING)
(PHOTOGRAPHY--STUDIOS AND DARKROOMS)

ACCESSION NR: AR4041548 S/0124/64/000/005/B045/B045

SOURCE: Ref. zh. Mekhanika, Abs. 5B257

AUTHOR: Vinogradov, B. S.

TITLE: Off-design operating conditions of a supersonic diffuser

CITED SOURCE: Tr. Kazansk. aviats. in-ta, vy*p. 76, 1963, 3-25

TOPIC TAGS: supersonic diffusier, diffuser, Laval nozzle, gas flow, off design condition

TRANSLATION: In the frames of one-dimensional theory there are expounded basic questions of flow of gas in the channel of a supersonic diffuser--reversed Laval nozzle--in off-design conditions. Expounded method allows one to understand physical processes and produce simplified calculations of diffusers in sketching and long-term designing. The reversed Laval nozzle works stably only in off-design conditions. All off-design conditions can be divided into two groups depending

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upon method of deviation from design conditions: by change of back pressure or by change of reduced incident flux velocity. The first group of off-design conditions of flow is obtained as a result of change of back pressure at the diffuser outlet at a design value of the reduced incident flux velocity. Flow of gas is possible only in the presence of a shock wave in the expanded part of the diffuser. If back pressure at the diffuser outlet is increased higher than design the shock wave leaves the bounds of the inlet, forming a detached bow wave. There are graphs of the change of reduced velocity and pressure along the diffuser in off-design conditions with a detached bow wave. There is expounded a method of calculation of conditions with a detached bow wave, conditions with overexpansion and terminal shock in the expanded part of the diffuser. There are given design curves allowing us to determine at what conditions the back pressure in a condition with a detached bow wave may be less or larger than design. The second group of off-design conditions is obtained during deviation of the reduced incident flux velocity from the design value. Flow of gas in the expanded part of the diffuser in this case, too, is determined by back pressure at the diffuser outlet. Three forms of flow are possible: 1) flow with a detached bow wave at

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the inlet and subsonic speeds in channel (flow rate less than maximum); 2) flow with shock wave in tapered part of diffuser and subsonic flow in remaining part; 3) flow with supersonic speed in tapered part and in throat and with shock wave in expanded part of diffuser. Transition of one form of flow into another can occur at constant reduced incident flux velocity only by change of back pressure at diffuser outlet. There are given universal characteristics of diffuser, allowing one to establish basic regularities of work of diffuser in changing conditions. Similar characteristics can be taken as the basis in developing theoretical methods of design and construction of characteristics of a real diffuser. Bibliography: 3 references.

SUB CODE: PR, ME ENCL: 00

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VINOGRADOV, B.S.

Graphic calculation of altitude characteristics of airplane engines taking the effect of Polikovskii's blades into consideration. Trudy KAI 24:116-127 '50. (MIRA 10-7)
(Airplanes--Engines)

VINOGRADOV, B. S.,

"Computation of a Centrifugal Compressor in Generalized Parameters," Trudy Kazanskogo Aviatsionogo Instituta, No 29, 1955, pp 139-167.

The following is a complete translation of an abstract of an article by B. S. VINOGRADOV. The abstract, published in a Soviet abstract journal, was written by M. G. Dubinskiy. (Ref. Zhur - Mekhanika, 6, 56 # 3529)

"A description is presented of a method of computing centrifugal compressors with which it is possible to determine the coefficient of pressure and the efficiency factor and then to establish the geometric dimensions and to compute the parameters of flow along the air channels of the compressor, regardless of the absolute dimensions of the compressor.

"It is first necessary to select the size of the tangential constituent of the absolute velocity of the air at the rotor outlet.

"At a given degree of the compression, the coefficient of pressure bears a definite relationship to this velocity. The author assumes that even with a significant error in the selection of velocity, the error in the coefficient of pressure would be small and it would therefore not be necessary to make a secondary approximation for the coefficient of pressure,"

VINOGRADOV, B.S.

Approximate calculation of aerodynamic resistance of the ventury tube in a supersonic flow. Izv.vys.ucheb.zav.; av.tekh. 2 no.3:46-56 '59. (MIRA 12:12)

1. Kazanskiy aviatsionnyy institut. Kafedra teorii aviadvigateley.
(Aerodynamics, Supersonic)

SOV/147-58-3-8/18

AUTHOR: Vinogradov, B.S.

TITLE: Characteristics of a Simple Supersonic Diffuser (Kharakteristiki prosteyshego sverkhzvukovogo diffuzora)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, 1958, Nr 3, pp 60-67 (USSR)

ABSTRACT: In the analysis of the characteristics of supersonic compressors, the air intake problems of jet engines as well as other applications of supersonic diffusers, it is important to understand the peculiarities of these diffusers when they are working under conditions which differ from the design conditions. The paper presents theoretically derived characteristics of such a simple diffuser (Laval nozzle in reverse) and discusses the types of flows possible under different conditions of operation. For the sake of clarity of discussion of the critical phenomena (chocking, shockless transition through the sonic speed, shock formation etc.) the analysis is simplified, i.e. based on the one-dimensional theory, friction is neglected and the oblique shocks are excluded. Consider a diffuser with its inlet section (Section 1-1, Fig.1) facing a uniform supersonic stream

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Characteristics of a Simple Supersonic Diffuser

and its exit section (Section 2-2, Fig.1) under the influence of the remainder of the propulsive system, which will decide the back pressure no matter what are the conditions at the inlet to the diffuser. The intermittent section is determined by the continuity equation as specified by the design requirement, i.e. so as to ensure the required mass flow rate G_p (the suffix p denotes design conditions) at the required speed as specified by its reduced (nondimensional) value $\lambda_{op} = W_{op}/a_{Kp.p}$ (here the suffix o denotes free stream conditions, p - design conditions, Kp ($\equiv$cr) - entical conditions). At the design conditions there is no distortion of the streamlines upstream of the inlet section ($f_o = f_1$), the flow is supersonic in the convergent portion of the duct, becomes sonic at the throat and reverts to supersonic in the divergent portion. Fig.1, full heavy line, gives the velocity distribution (λ) along the duct in this case. As the characteristics of the diffuser we shall take the graphs of the pressure p_2 at the exit section and of the coefficient of pressure

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recovery $\sigma = p_2^*/p_0^*$ as functions of the mass flow (Fig.2). Each curve represents a fixed (constant) reduced velocity of the free stream. Static pressure and the temperature of the free stream is assumed the same for all cases (p_0 = 1,033 kg/cm^2; T_0 = 288°C). The computation was carried in accordance with Eq.1, 2 and 3 where: the asterisk denotes total magnitudes at the corresponding sections, f_r(=252cm^2) - is the throat area; $q(\lambda)$ - reduced rate of flow; σ_0, σ_1, σ_2 - respective coefficients of pressure recovery: at the pre-entry shock wave, convergent duct shock and divergent duct shock (if any of these shocks vanishes then the corresponding σ = 1). Assuming various values for λ_2 the corresponding values of λ_2 are obtained from $q(\lambda_2)$ as given in Eq.4 and σ from Eq.5. For the main stream shock the velocity ahead of the shock is $\lambda' = \lambda_0$. In order to evaluate the reduced velocity in front of the shock (λ') and behind it (λ'') when the shock is in the duct, it is necessary to determine the area of the duct where the shock is formed and then use Eq.6 for the converging portion or Eq.7 for the diverging portion of

the duct. Fig.2 shows the characteristics of the diffuser: the bottom curves represent pressures (p_2 kg/cm^2) against mass flow (G kg/sec) and the top curves the pressure factor σ. Figures on the right represent types of flow for various operational condition of the system, corresponding to given points on the bottom diagram. Depending upon the magnitude of λ_o three different modes of flow may be noticed from these curves: 1) Velocity of the free stream below the design conditions ($\lambda_o < \lambda_{op}$). In this paper the design velocity was taken as $\lambda_o = 1.4$. In this range each pressure curve of Fig.2 has a single sloping branch and a single vertical branch. 2) First range of the free stream velocities above the design conditions ($\lambda_{op} \leqslant \lambda_o < \lambda_{ok}$). In this case $\lambda_{ok} = 1.53$. In this range each curve has a single sloping branch and two vertical branches. 3) Second range of the free stream velocities above the design conditions. In this range each pressure curve has again a single sloping branch and a single vertical branch but the latter extends in both directions

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of the inclined branch. Along the sloping branches the mass flow G changes, but along the vertical portions it remains constant, i.e. the duct is chocked. Thus in the first region of the speeds above the design value there are two modes of chocking for every value of λ_0; and two different mass flows corresponding to these modes of chocking. For the design velocity (point p in Fig.2) the flow through the diffuser is shockless. For the speeds below the design value the flow in the contracting part remains unchanged along each vertical branch of the pressure curves, becomes sonic at the throat and transforms into subsonic through a normal shock in the divergent part, the shock becoming stronger as it moves towards the exit section. The flow is thus stable along these lines except for the design point p_1 where with some increase in pressure p_2 ($p_2 > p_{2p}$) the supersonic flow in the duct with increased mass being impossible, there appears a detached shock in the free stream ahead of the intake section, behind which a subsonic flow is formed. This subsonic stream speeds up again in the convergent portion of the duct until it becomes sonic at the throat

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and then reverses to subsonic in the divergent portion of the duct (lines OPRGλ - 2_p and OPRST in Fig.1). This is how the first mode of chocking is developed. Further pressure increase in p_2 results in formation of shocks in the divergent portion after the flow sped up above the sonic speed past the throat. The inclined branches of the pressure curves in this region of speeds represent a similar type of flow with a detached shock ahead of the mouth of the duct, speeding up along the convergent part but without becoming sonic at the throat, i.e. the duct acts as a Venturi tube (line ZILMN in Fig.1). As p_2 increases still further λ_t decreases more and more, the shock in the free stream moves further upstream, the capture area decreases as a result of which the mass flow decreases as well. In the first range of velocities of the free stream above the design value ($\lambda_{op} \leqslant \lambda_o < \lambda_{ok}$) the flow corresponding to the vertical branches of the first mode of chocking is similar to that when $\lambda_o = \lambda_{op}$. But along the vertical branches of the pressure curves representing the second mode of chocking there are two

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possible types of flow: 1) Supersonic at the entrance, normal shock in the convergent part, subsonic flow between this shock and the throat, changing into supersonic past the throat, a second normal shock in the divergent part and subsonic flow behind it up to the exit. (This type of flow is marked by open squares in Fig.2). 2) Supersonic flow in the convergent part throughout, at the throat and at the beginning of the divergent part, normal shock in the divergent part and subsonic flow further down up to the exit (Full points in Fig.2). Under given conditions at the entrance it is possible to obtain the same parameters of the flow at the exit in both types of flow. Only with very low p_2 the first mode of flow invariably realized. As λ_o increases from λ_{op} to λ_{ok} the vertical branches of the pressure curves approach each other and above λ_{ok} only one branch (the second mode of chocking) exist, due to the fact that the shock in the main stream approaches steadily the mouth of the diffuser and at λ_{ok} attaches itself to it. Further increase of λ_o results in the shock being swallowed by the duct and passed downstream towards the

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throat and this is the characteristic of the second mode of chocking. Under these conditions there are again two types of flow possible: 1) a shock wave in the convergent part of the duct and subsequent subsonic flow throughout (Venturi tube effect); 2) supersonic flow in the convergent part, at the throat and some distance past the throat, a shock wave and subsequent subsonic flow in the divergent part of the duct. In order to produce the second mode of chocking in a diffuser it is necessary first to overspeed the free stream above λ_{ok}, at which the diffuser will be able to swallow the shock, and then shortly reduce the speed up to the given magnitude. The magnitude of the reduced velocity λ_{ok} of the oncoming stream at which the shock can be swallowed depends upon λOP (Fig.4). The higher the value of λOP the larger overspeeding is required in order to produce the swallowing of the shock. Thus the first mode of chocking is a stable one, while the second is not and it is easy to pass from the second mode to the first and this tends to produce disturbing fluctuations of pressure at the end

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of the diffuser. The actual characteristic of a diffuser will be somewhat altered due to friction being present, possibility of separation etc. But Deych's experiments (Ref.2) show that the character and nature of the phenomena are described above. There are 4 figures and 3 Soviet references.

ASSOCIATION: Kazanskiy Aviatsionnyy Institut, Kafedra Teorii Aviadvigateley (Kazan' Institute of Aeronautics, Chair of the Theory of Aero-engines)

SUBMITTED: 29th January 1957.

Card 9/9

68942
S/147/59/000/04/019/020
E031/E413

10.2000

AUTHOR: Vinogradov, B.S.

TITLE: The Approximate Calculation of the Bow Wave Ahead of a Cylindrical Body with a Centre Body in a Supersonic Flow

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1959, Nr 4, pp 155-160 (USSR)

ABSTRACT: The approximate calculation described in this paper is based on the method developed by V.A.Matveyev (VVIA imeni N.Ye.Zhukovskiy) for calculating shock waves ahead of a plate of finite thickness in plane flow at supersonic velocity. The central part of the detached shock can be calculated as a simple discontinuity. The periphery of the bow wave is a surface of revolution with a curvilinear generator and it has been shown, for example in Ref 2, that this generator can be represented by the equation to a hyperbola to a sufficient degree of accuracy. The x-axis is directed along the line of the flow separating the internal and external flow in the undisturbed stream and the origin of coordinates is taken at the point of intersection of

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68942

S/147/59/000/04/019/020
E031/E413

The Approximate Calculation of the Bow Wave Ahead of a Cylindrical Body with a Centre Body in a Supersonic Flow

the x-axis with the line of small disturbances. The equation to the hyperbola then takes its canonical form. At infinity, the shock wave degenerates into a cone of small disturbances. The use of this observation enables the author to write the equation to the hyperbola in a more convenient form and, using this, an expression is derived for the distance of the shock wave from the intake. The parameters in this expression are defined by the Mach number and the mass flow across the shock wave and through the intake. Two angles which occur in the expression may be determined graphically or from shock polars or from special tables. There are 1 figure and 2 Soviet references.

ASSOCIATION: Kafedra teorii aviadvigateley Kazanskiy aviatsionnyy institut (Chair of Avio-engines Theory, Kazan Aviation Institute)

SUBMITTED: June 30, 1959

Card 2/2

4

S/124/62/000/004/010/030
D251/D301

24.4300
26.2120

AUTHORS: Vinogradov, B. S., Krasil'nikov, V. A., Alemansova, N. A. and Novikov, A. L.

TITLE: Investigating the working process and the characteristics of centrifugal compressors

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 4, 1962, 39, abstract 4B235 (Tr. kazansk. aviats. in-ta, 1960, no. 56

TEXT: Existing methods of calculating the flow part of a centrifugal compressor with the application of results of experimental investigations conducted in the Kazanskiy aviatsionnyy institut (Kazan Aviation Institute) between 1949-1959 were described and discussed. The described experiments were carried out on the basis of two compressors of types ТК-19 (TK-19) and АМ-35А (AM-35A) with straight radial blades having two variants of the working wheels (closed and semi-closed) and two variants of the diffusors (with and without blades). The work consists of five chapters. In the first are described the known basic dependences between the para- 18

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meters of a centrifugal compressor obtained with the help of one-dimensional jet calculation theory. The second chapter is devoted to the experimental investigation of the flow of air in a working wheel. The distribution of the flow parameters is measured at various radii and in the outlet section with respect to the breadth of the inter-blade channel and the blade height for the closed and semi-closed wheels. Numerous graphs are given. The well-known lack of coincidence between the actual distribution of the parameters and the theoretical distribution for the uninterrupted flow of an ideal liquid is confirmed, and for some regimes the dip in the curve of pressure distribution with respect to the channel breadth is shown. The influence of the air circulation is analyzed for the working of a wheel of semi-closed type. All investigations in this chapter are carried out for small subsonic velocities of rotation. In the third chapter an appraisal is made of the experimental investigation of the air flow in bladeless and bladed diffusors, also carried out for small subsonic velocities, and a comparison made with previously published data. Graphs are given for the distribution of the parameters along the breadth and length of

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D251/D301

the channel. Possibilities are considered of improving the characteristics of the compressors with a project of a bladed diffusor taking into consideration the structure of the running current, and corresponding recommendations are given for the design and set-up of a bladed diffusor. It is affirmed, in contrast to recommendations wide-spred in the literature, that the directing blades ought to be set up with a minimum distance between the wheel and the forward edge of the blade. The entry angle of the blade, it is recommended, should be made as small as possible, and even equal to zero. In the fourth chapter the construction of the characteristics is considered of the compressor, the most convenient coordinate system is discussed, and the influence on the characteristics of various similarity criteria. The possible displacement is discussed and the deformation of the curves of the characteristics due to different atmospheric conditions at the entry. In the fifth chapter an approximation method is proposed for the evaluation of the characteristic of the centrifugal compressor with revolution of the blades of the entry directing apparatus, if the characteristics are known for some given angle of the blade set-up. A method is

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Investigating the working ... S/124/62/000/004/010/030
D251/D301

recommended for compressors with regularized entry directing apparatus. It is necessary to point out that each form of the experiments of the KAI was carried out only for one type of compressor, which makes the wide generalization of the data difficult. 51 references. [Abstracter's note: Complete translation.]

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S/147/62/000/004/016/019
E031/E113

AUTHOR: Vinogradov, B.S.

TITLE: Determination of the boundary of the central part of the flow and the coefficient of pressure restoration in short channels of circular section

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, no.4, 1962, 151-154

TEXT: Two values of the velocity are required: one at the centre of the flow and the other somewhere in the boundary layer. Using the expression for the ratio of these velocities it is shown that in order to determine the non-dimensional radius of the central part of the flow the total and static pressure in the central part and at radius $r = R - y$ (R is the radius of the channel) in the boundary layer. It is shown that no additional data are required for the determination of the pressure restoration coefficient.
There is 1 figure.

SUBMITTED: April 4, 1962

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L 22651-66 EWT(1)/EWP(m)/EWP(m)/EWA(1) JS
ACC NR: AT6007553 SOURCE CODE: UR/2529/63/000/076/0003/0025

AUTHOR: Vinogradov, B. S. (Candidate of technical sciences; Docent)

ORG: none

TITLE: Off-design regimes in the operation of a supersonic diffusor

SOURCE: Kazan. Aviatsionnyy institut. Trudy, no. 76, 1963. Aviatsionnyye dvigateli (Aircraft engines), 3-25

TOPIC TAGS: diffusor, air breathing propulsion, supersonic diffusor

ABSTRACT: A one-dimensional analysis was made of the off-design operating conditions of a simple supersonic diffusor consisting of an inverted Laval nozzle. In the design regime, i.e., the regime established when the streamlines at the diffusor entrance are parallel, there are no compression waves present in the diffusor, the velocity decreases gradually, and transition from supersonic to subsonic flow takes place in the throat. This regime, however, is unstable and therefore is important only as a theoretically possible regime. Stable diffusor operation is possible only at off-design conditions when the deviations from the design regime are small. Two types of off-design regimes can be established 1) by varying the back pressure and 2) by varying the reduced velocity of the approaching flow. The following relationships were plotted for these regimes: reduced flow velocity and pressure vs. location in the nozzle and diffusor characteristics, i.e., the relationships between the

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ACC NR: AT6007553

pressure at the diffusor exit and the pressure recovery facter vs. the gas flow rate. The various properties of the flow conditions, such as location of the shock wave, choking, etc., are discussed in detail. The plotted characteristics are only theoretical, but describe the basic relationships in the individual flow regimes and can be used for developing theoretical design methods and for constructing the characteristics of real diffusors. Orig. art. has: 8 figures and 14 formulas. [PV]

SUB CODE: 21, 01/ SUBM DATE: 03Sep62/ ORIG REF: 003/ ATD PRESS: 4216

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L 13591-63 EPR/EPA(b)/EWT(1)/BDS AFFTC/ASD Ps-4/Pd-4 RM/WW
ACCESSION NR: AP3004722 S/0147/63/000/002/0060/0064 64

AUTHOR: Vinogradov, B. S.; Shaykutdinov, Z. G.

TITLE: An approximate method for calculating the detached bow shock wave in supersonic flow past blunt bodies

SOURCE: IVUZ. Aviats. tekhnika, no. 2, 1963, 60-64

TOPIC TAGS: supersonic flow, detached shock wave, shock wave, blunt body, plane flow, axisymmetric flow, sonic line, inviscid flow

ABSTRACT: An approximate method is outlined for rapid evaluation of basic parameters of a detached bow shock wave and of flow behind it. It may be applied with sufficient practical accuracy either to plane or axisymmetric flows. It is assumed that 1) the characteristic of the shock wave front can be approximated by the equation of hyperbola; 2) the sonic line is a straight line at the angle $(\pi/2) - \delta_{cr}$ to the direction of flow; and 3) the gas is inviscid; i.e., there is no boundary-layer formation on the body surface. The flow configuration is given in Fig. 1 of the Enclosure. Two cases of flow are considered: plane and axisymmetric. The results of numerical calculation of a transverse plane flow past a cylinder are given in Fig. 2. A comparison of the results with those obtained by

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L 13591-63
ACCESSION NR: AP3004722

O

other methods shows better agreement with experimental data, though in the case of axisymmetric flow the results are less consistent. Orig. art. has: 2 figures and 24 formulas.

ASSOCIATION: none

SUBMITTED: 18Jul62 DATE ACQ: 06Sep63 ENCL: 01

SUB CODE: AI NO REF SOV: 002 OTHER: 001

Card 2/2

ACCESSION NR: A

TITLE: Testing stagnation [illegible] method of equivalent pressure drop

SOURCE: IVUZ. Aviatsionnaya tekhnika, [illegible], 157-162

TOPIC TAGS: stagnation temperature, temperature transducer, [illegible] flow, supersonic flow, temperature measurement

ABSTRACT: This article describes a method of equivalent pressure drop [illegible] for measuring stagnation temperatures. [illegible] temperature [illegible] testing the transducer [illegible] pressure drop between the entrance and exit [illegible] the velocity and heat transfer conditions are the same [illegible] regime. Although the [illegible] than in an ordinary wind tunnel [illegible] requirements are [illegible]. The method was checked experimentally by using the test setup [illegible] gram. The results confirmed the accuracy of the method. [illegible] advantages [illegible] method are outlined. Orig. art. has: [illegible] figures and 8 formulas.

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ACCESSION NR AP5020650

ASSOCIATION: none

SUBMITTED: 16Jun64

ENCL:

SUB CODE: ME

NO REF SOV: 004

OTHER: 000

ATD PRESS: 4066

Card 2/2

VINOGRADOV, B.V.; KAMENITSER, S.Ye.

[Collection of problems on methods of industrial planning calculations] Sbornik zadach po metodike zavodskikh planovykh raschetov. Pod red. S.E.Kamenitsera. [Moskva, Gospolitizdat] 1952. 287 p.
(Industrial management) (MLRA 7:11)

VINOGRADOV, B.V.

Examples of vegetation and soil relation to the most recent tectonic structure. Bot.zhur.40 no.6:837-844 N-D '55. (MLRA 9:4)

1.Laboratoriya aerometodov AN SSSR, Leningrad.
(Phytogeography) (Physical geography)

VINOGRADOV, B.V.

Macropolygenality of clayey plains. Dokl.AN SSSR 104 no.1:118-120 S '55. (MLRA 9:2)

1.Laboratoriya aerometodov Akademii nauk SSSR. Predstavleno akademikom D.V.Nalivkinym.
(Clay) (Plains)

VINOGRADOV, B.V.

Selecting the time for aerial photography in desert landscapes of southern Central Asia. Trudy Lab.aeromet. 5:157-171 '56.
(Soviet Central Asia--Photography, Aerial) (MIRA 10:1)

VINOGRADOV, B.V.

Microphotometric characteristics of photographic representations of certain desert plants in aerial photographs at a scale of 1:5000. Trudy Lab.aeromet. 5:196-203 '56. (MIRA 10:1)
(Photographic interpretation) (Desert flora)

VINOGRADOVA, G.A.; VINOGRADOV, B.V.

In memory of V.L. Leontiev. Izv.Vses.geog.ob-va 88 no.2:196-198
Mr-Ap '56. (MIRA 9:8)
(Leont'ev, Vladimir Leonidovich, 1904-1955)

VINOGRADOV, B.V.; MIROSHNICHENKO, V.P.

Evidence of present-day movements in the landscapes of silt planes. Dokl. AN SSSR 109 no.2:369-372 Jl '56. (MLRA 9:10)

1. Laboratoriya aerometodov Akademii nauk SSSR. Predstavleno akademikom D.V. Nalivkinym.
(Turkmenistan--Geology, Structural)

VINOGRADOV, B.V.; YANUTSH, D.A.

Some possibilities of using a recording microphotometer in deciphering aerial photographs. Zhur.nauch.i prikl.foto i kin. 2 no.2:136-145 Mr-Ap '57. (MLRA 10:5)

1. Laboratoriya aerometodov Akademii nauk SSSR.
(Photographic interpretation)
(Microphotometer)

VINOGRADOV, B.V.

PA - 2457

AUTHOR VINOGRADOW, B.V., VOLKOV, I.A., MIROSHNICHENKO, V. PREOBRAZHENSKYY, A.

TITLE The Application of Aerographic-Photogrammetric Methods for the investigation of landscapes. (Primyenyeniye aerometodov pri izuchenii landshaftow).

PERIODICAL Vestnik Akademii Nauk SSSR, 1957, Vol.27, Nr.1, pp 23 - 29, (U.S.S.R.)

Received 5 / 1957 Reviewed 5 / 1957

ABSTRACT The first photogrammetric investigations were performed in desert areas of Turcmenia during the year 1950 and were continued in the years 1954 - 56 in forest areas, treeless steppelike plains and desert - like regions of Kasakhistan. A special department dealing with the development of methods for the complex geological and geographical research and the classification of landscape characteristics based on photogrammetric procedures in the different zones and landscapes of the USSR, was established at the Academy of Science of the USSR.
According to the theory of L.S. Berg, which was further developed by L. Ramenski, S. Kalesnik, N.Solntsev, A. Isachenko and others, geographical units which are closely connected and together build up the geographical landscapes, have been selected as the basis of classification. Geomorphological observations, and geographical investigations on the basis of the profiles obtained by aerographic methods are studied by specialists competent in their field, hydrogeologists, botanists, as well as by

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experts on soil and landscape. The flora of a landscape is used as the determining factor in the deciphering of the various characteristics of a landscape. Therefore the flora is taken as an indicator of the geographical characteristics of the region. Experience hitherto gained by research shows that the methodes of deciphering change with the objectives and the scale of photogrammetric research. In every case, however, the key points are ascertained and photographed on a larger scale than other parts of the region. The best productive results are obtained by evaluating the profiles through characteristic components of the landscape. Finally, landscape maps are produced on a scale of 1 : 500.000 - 1 : 1.000.000 to define the boundaries of the physical-geographical regions, on a scale of 1 : 100.000-1:200.000 to register landscapes of second order and the characteristics of smaller regions, and on a scale of 1:25.000-1:5000 to delineate natural boundaries and the geographical facies.
The author emphasizes that the results hitherto obtained are inconsiderable. From the experience gained it appears that research on photogrammetric basis should be directed to the following points: Separation of topological units, investigation of the structure of the landscape, classification into regions, and study of zone and provincial characteristics as well as of the interrelation

The Application of Aerographic-Photogrammetric Methods PA - 2457
for the Investigation of Landscapes.

between the various elements, to the genesis of landscapes, and the specification of dynamics and rhythmic cycles prevailing at present, the task of mapping and the evaluation of the cultural standard and the economic potential. (With 8 aero-photogrammetric pictures of desert ranges in western Turcmenia and on aerial photograph of the steppe.)

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VINOGRADOV, B.V.

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3(4) PHASE I BOOK EXPLOITATION SOV/1835

Akademiya nauk SSSR. Laboratoriya aerometodov

Trudy, t. 6 (Transactions of the Laboratory of Aerial Methods, USSR Academy of Sciences, Vol 6) Moscow, Izd-vo AN SSSR, 1958. 280 p. Errata slip inserted. 1,500 copies printed.

Resp. Ed.: V.P. Miroshnichenko, Candidate of Geological and Mineralogical Sciences; Ed. of publishing House: D.M. Kudritskiy; Tech. Ed.: E.Yu. Bleykh.

PURPOSE: This volume is intended for geologists, photo interpreters, or other personnel engaged in the study of landscape formations, especially from the standpoint of aerial photography.

COVERAGE: This collection of studies and brief articles treats problems in aerial photography and photo interpretation in relation to geological phenomena. The geographical area of study, with minor exceptions, is the Caspian plains and western shore. Most of the studies are well illustrated with aerial photographs. Aside from the numerous articles on geological phenomena of the Caspian basin, the following are also covered: portions of the Russian platform, the Muyunkumy sands of Central Kazakhstan, photo interpretation of clayey flats, desert vegetation and tree cover, the effective lens speed of photographic objectives, photogrammetric determination of profiles on hydro technical models, and others. No personalities are mentioned. References follow each main article.

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Principles for interpreting desert vegetation on large-scale aerial photographs. Trudy Lab. aeromet. 6:108-119 '58. (MIRA 12:1)
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